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Implementation of OSI Layer Based on Interactive Education Media

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ABSTRACT`

The design of basic network learning media using computer technology based on interactive educational media aims to facilitate the introduction of basic networks using interactive educational media so that they are more interested and able to follow and pay attention to the explanation conveyed through an OSI Layer work process in learning the basic network. In order to make it easier for readers, and faster to master and be able to practice for students who want to learn about the basic network introduction to the OSI Layer.

1. Introduction

In the school system in Indonesia, vocational education is carried out through Vocational High Schools (SMK) (Jatmoko, 2015). Based on the Government Regulation of the Republic of Indonesia Number 66 of 2010, it explains that SMK is a form of formal education unit that organizes vocational education at the secondary education level. The purpose of SMK is to produce graduates who are ready to work in accordance with their field of expertise either to work with others as workers and entrepreneurs (Putri, 2014). It can be interpreted that SMK graduates are better prepared to work and / or live independently in society (Subijanto, 2012). Based on the Vocational School Curriculum Policy Study, there are several problems that develop in the vocational world, one of which is that the learning load is felt to be very heavy with the demand for a comparison of face-to-face time allocation, school practice, and industrial practice is 1: 2: 4 (Ministry of National Education, 2007) . This can be interpreted that generally learning in SMK will be dominated by practical activities rather than the delivery of material in the classroom, so that the provision of a strong basis for understanding material in schools is less fulfilled. One of the subjects in the Computer and Network Engineering Vocational School (TKJ) that requires a good understanding is basic network subjects. Basic network subjects are the basic compulsory subjects of the TKJ expertise program. Basic networking lessons in the 2013 Curriculum are vocational lessons included in the C2 group (basic skills program), for class X (ten) (Tirta, Santyasa, & Warpala, 2014).

Especially in the material of the Open Systems Interconnection (OSI) model, the layer is a difficult material. Based on the results of interviews with teachers who teach basic network subjects, the OSI layer model material is difficult material because students experience problems in analyzing the logic of the material. Generally, what students do when they do not understand the material is usually ask their friends as well as the teachers who teach. There are also students who search for material sources on the internet. In addition, there are not a few students who just stay silent when they do not understand the material presented. This is due to the limited availability and completeness of the supporting media used by the teacher in the learning process so that students have difficulty understanding the subject matter. Where generally alternative media are used by teachers when delivering material, namely providing modules and using Power Points (PPT), but this has not been effective because there are some materials that are difficult to put into media considering the breadth of the learning material and the characteristics of the abstract material. That is, because the use of learning methods, namely the lecture method, dominates the teacher center, where learning is teacher-centered so that learning is limited to the teacher's explanation in front of the class.

One way to address this problem is the use of interactive educational media in the basic network learning process to help students understand the basic network material presented. This activity can run well if it is supported by the existence of interactive educational media or infrastructure at the school. Learning media serves as a tool that attracts attention and to foster children's interest in participating in the learning process and learning media also functions as a tool to avoid verbalism. One of the learning media used in this study is to use interactive educational media. Interactive educational media is a technology-based learning

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media that is very familiar with the world of student and female play. Playing is a direct and spontaneous activity in which a student and student uses other people or objects around him happily, voluntarily, and imaginatively, using their feelings, hands, or all their limbs. Through interactive educational media directly students and students will learn about emotional intelligence without realizing it. Through interactive educational media it is hoped that students will be more interested in learning. Based on the description above, it is necessary to build an "Implementation of the OSI Layer Based on Interactive Education Media".

2. Literature

2.1 OSI Layer

According to Iwan Sofana (Cisco CCNA and Computer Networks, 2010: 91). The OSI (Open System Interconnection) layer is one of the network architectures that is often used to explain how computer networks work logically. In general, the OSI model divides various network functions into 7 layers. The institution that publishes the OSI model is the International Organization for Standardization (ISO). This model was introduced in 1984. The OSI layer is divided into 7 parts, namely:

a. Application Layer Application layer is the seventh layer and is the top layer in the OSI model. This layer provides the interface between the applications used to communicate and the underlying network through which our messages are transmitted. Application layer protocols are used to exchange data between programs running on the source and destination hosts.
b. Presentation Layer The presentation layer is responsible for presenting data to the application layer. The presentation layer is like a translator of a network.
c. Session Layer The session layer is in charge of establishing and ending a session (session) between two communicating hosts.
d. Transport Layer The transport layer is the layer whose job it is to ensure messages sent are error free.
e. Network Layer Network layer is the third layer in the OSI layer. Network service provides services for exchanging a single piece of data over a network between end device devices.
f. Data Link Layer The data link layer provides a means to exchange data over common local media.
g. Physical Layer The physical layer is the OSI layer which is located at the bottom. The physical layer defines the network transmission media to the physical media and carries signals to higher layers.

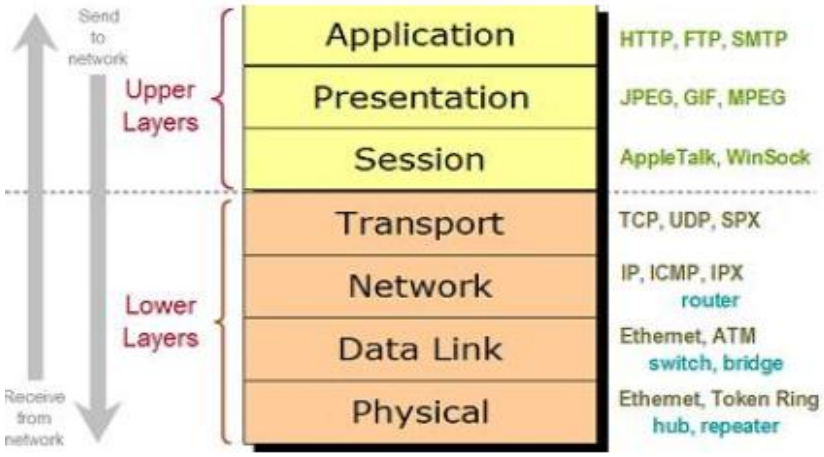

Fig 1. OSI Layer

2.2 Interactive Educational Media

According to Hujair AH Sanaky (2013: 4). Learning media are educational tools or aids that can be used as intermediaries in the learning process to enhance effectiveness and efficiency in achieving teaching goals. Thus it can be concluded that learning media is an intermediary used to convey information or lessons in order to stimulate students to learn. Meanwhile, the use of learning media is a way to convey information in the form of learning materials. With the media, it is hoped that the learning process will be easier for students, because learning media can overcome the limitations of space and time in learning, besides that the media can also provide motivation for students to learn.

3. Research methods

To find out and clarify in knowing the outline of the preparation of this research, what will be used in

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making this interactive educational media application are:

a. Introduction
Doing library research to find references in the form of books, journals related to Macromedia Flash 8-based learning.

b. Analysis
After the data obtained from the literature study were collected, then a solution was made to the Macromedia Flash 8-based learning.

c. Design
Designing instructional media, then designing applications using macromedia flash 8.

d. Implementation
In this implementation, testing and testing of the design results is carried out.

e. Testing
Steps in testing the design before drawing conclusions.

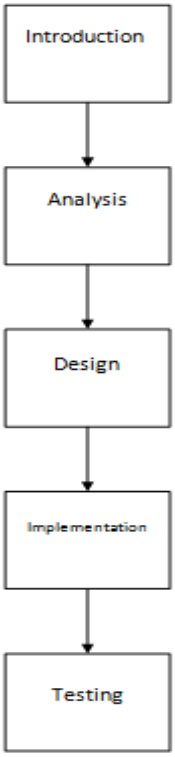

Fig 2 Methodology Flow Framework

4. Results and Discussion

4.1 System planning

System design is the stage after analysis of the contents of the system development clause, defining the functional requirements and preparations for system designs. Below is the Design of the OSI Layer Implementation System Based on Interactive Education Media :

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Fig 3 System planning

4.2 Implementation and System Testing

Implementation is an action or implementation of a plan that has been prepared carefully and in detail. Implementation is usually carried out after the planning is considered complete. The implementation of this decision support system consists of the following requirements:

a. Hardware Requirements

In a system in order to run as desired it cannot be separated between hardware and software and the specifications required in designing the system.

1) Processor core I3
2) Hardisc Minimum 500 GB
3) 3 GB RAM
4) Monitor
5) Keyboard
6) Mouse

b. Software Requirements

In order for this system to run smoothly, it is inseparable from the existence of software that clearly supports the above hardware, along with the software needed to run the system.

1) Windows 7 Operating System
2) Macromedia Flash Professional 8

c. System Implementation Objectives

The purpose of making the implementation must be appropriate so that the system that has been designed is as expected. Following are the objectives of the system implementation are:

1) Complete the existing system design in the new or approved documentation.
2) Ensuring that the user can easily operate the system that has been created.
3) Ensuring the system has run smoothly by controlling and installing correctly.
4) Taking into account that the system has met the demands of users, namely testing the system as a whole.

d. System Testing

The test results of this system have been designed using Macromedia Professional 8, where to type the program listing is done in the action script which is a software. Following are the results of testing the overall program system that has been designed.

1) Main Menu Display

   The main menu display is the start page of the OSI Layer application based on this interactive educational media. On this page there is an animation, followed by text and a button to go to the next page.

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Fig 4 Main Menu Display

2) OSI Layer Display

The OSI layer display is a display of the OSI layer recognition process to make it easier for students and students in the basic network learning process to introduce OSI layers based on interactive educational media in the image below:

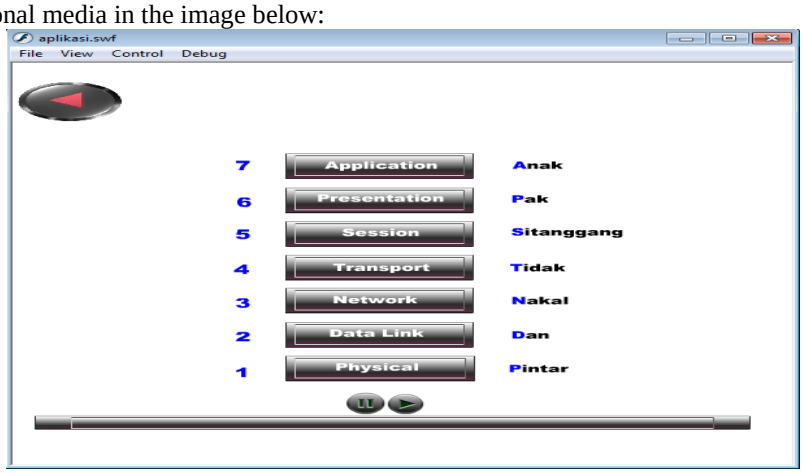

Fig 5 OSI Layer Display

3) Data Encapsulation Display-1

Display Data Encapsulation-1 the process of transferring network signals to the destination computer for sending segments from one computer to another.

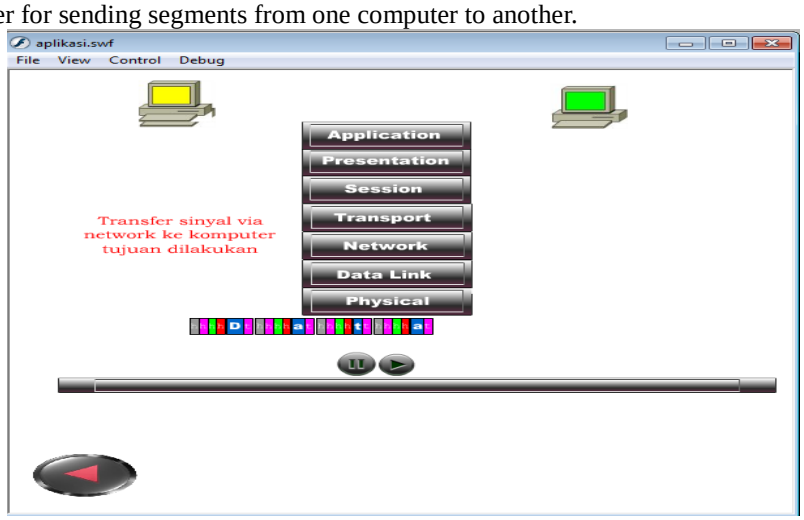

Fig 6 Data Encapsulation Display-1

4) Data Encapsulation Display-2

Display Data Encapsulation-2 is almost the same as the Data-1 Encapsulation process, but the difference is that the network signal transfer to the destination computer is carried out for sending

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segments while Data Encapsulation-2 sends data from one computer to another.

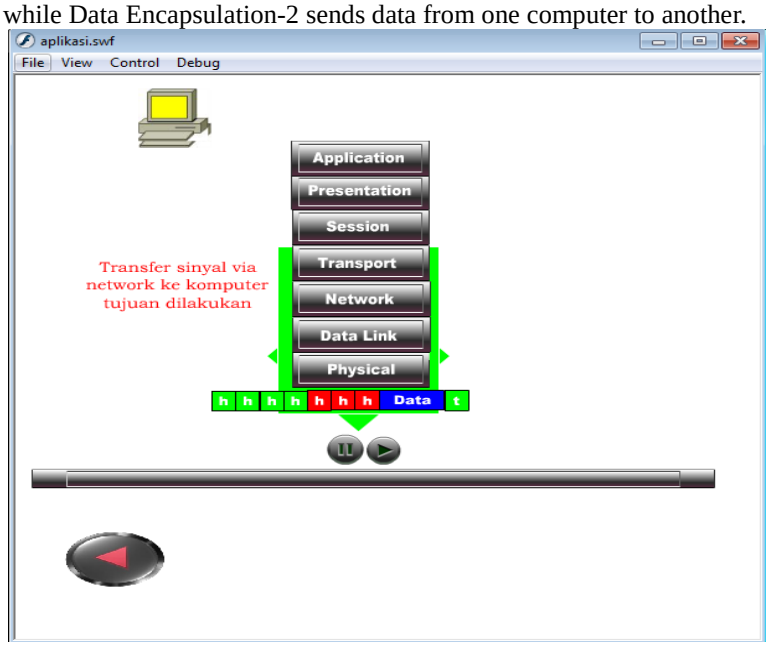

Fig 7 Data Encapsulation Display-2

5) OSI and Routing views

This display is the OSI work process and the routing of sending data to computer 1 to computer 2. The work process can be seen in the image below :.

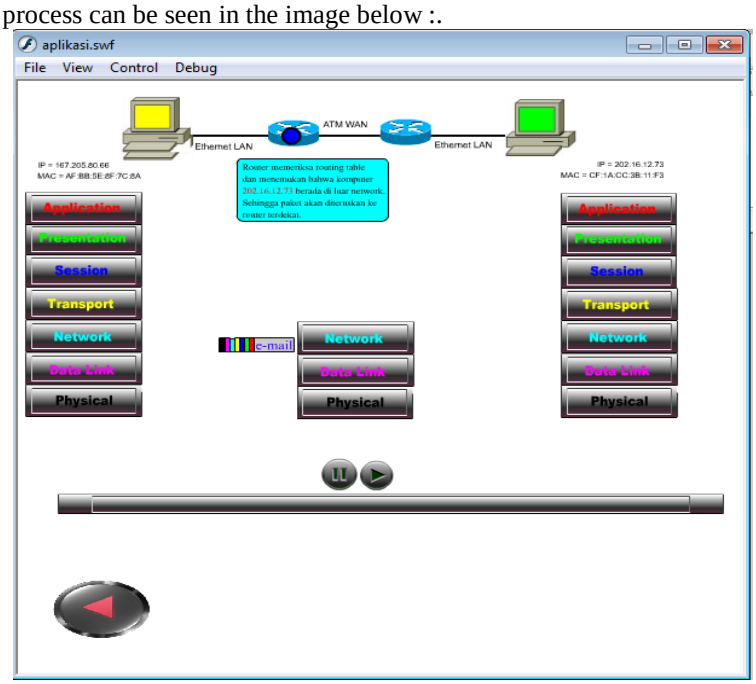

Fig 8 OSI Display and Routing

5. Conclusion

In closing the discussion in this study, the authors draw conclusions as well as provide suggestions to readers who use interactive educational media on basic network learning material that discusses the OSI Layer. The conclusions that the authors get are as follows:

a. Building interactive educational media with Macromedia Flash 8 is very easy because this application has been studied a lot on social media and many books about Macromedia Flash 8.
b. With interactive educational media it makes it easier for students and students because the media is in the form of animation and exposure to the OSI Layer in learning basic network introduction.
c. Very interested because interactive educational media about the OSI layer has not been used in this

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school because it is in the form of animation in the OSI Layer work process

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